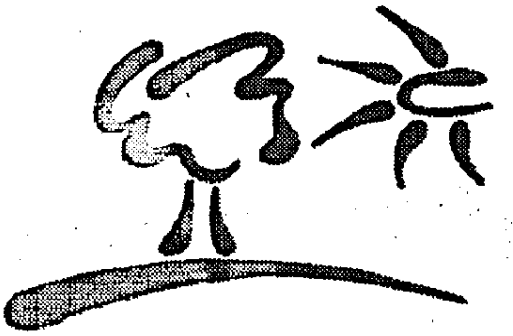
REPORT



CONSULTING SERVICES BY ENVIRONMENTAL RESOURCES MANAGEMENT

WORLDWIDE WRA REGULATORY AFFAIRS

Philip Morris Companies Inc. Environmental Policy - WRA Supplementary Report: *Summary of Ambient Air Quality Standards*

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REPORT

Philip Morris Companies Inc.
Environmental Policy - WRA

Supplementary Report:
Summary of Ambient Air Standards

Reference: 4135.01

For and on behalf of Environmental Resources Management	
Approved by:	Paul Wenman
Signed:	Paul Wenman
Position:	Director
Date:	20 June 1997

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1 INTRODUCTION

This document presents tables setting out ambient air quality standards for the following countries:

- The European Community
- Australia
- Brazil
- China
- Germany
- Japan
- Poland
- South Korea
- United Kingdom

The tables explain the legal status of the standards, set out the standards applying to each substance, and provide information relating to the items of legislation under which standards are issued and a brief summary of how that legislation establishes standards. However, the tables do not provide a fully comprehensive list of ambient air quality standards for the countries covered. Where countries have prescribed standards for a particularly long list of substances, or where standards are too complex to be easily transposed within the structure of the tables, Annexes set out these standards in full. Annexes have also been provided for those countries where copies of the standards from the original legislation have been obtained.

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1.1 TABLE 1: AMBIENT AIR QUALITY STANDARDS - EC

Legislation	Summary	Standards				Comments
		Status	Substance	Value	Reference Period	
Council Directive 85/203/EEC on air quality standards for nitrogen dioxide	Establishes a binding limit value (in Annex I to the Directive) and a non-binding guide value (in Annex II) for nitrogen dioxide in the atmosphere.	Limit Value	NO_x	200µg/m³	98th percentile of hourly values, over the year	Compliance by 1 January 1987.
		Guide Value		50µg/m³	50th percentile of hourly values, over the year	
		Guide Value		135µg/m³	98th percentile of hourly values, over the year	
Council Directive 80/779/EEC on air quality limit values and guide values for sulphur dioxide and suspended particulates (See Annex A)	Establishes binding limit values (in Annex I) and non-binding guide values (Annex II) for sulphur dioxide and suspended particulates in the atmosphere.		SO_2 Suspended Particulates	Standards set out in Annex A		Compliance by 17 July 1982.
Council Directive 92/72/EEC on air pollution by ozone	Establishes a series of threshold values for ozone concentrations in air, to establish a harmonised procedure for monitoring, for exchanging information and for informing and warning the population with regard to atmospheric ozone pollution.	Health Protection Threshold	Ozone	110µg/m³		A limit value which 'should not be exceeded if human health is to be safeguarded in the event of prolonged pollution.
		Vegetation Protection Thresholds		200µg/m³ 65µg/m³	mean 8 hour value mean 24 hour value	Values beyond which vegetation may be affected.
		Population Information Threshold		180µg/m³	mean 1 hour value	Value beyond which Member States must take steps to provide the public with specified information (set out in Annex IV to the Directive).
		Population Warning Threshold		360µg/m³	mean 1 hour value	Value beyond which Member States must take steps to provide the public with specified information (set out in Annex IV to the Directive).
Council Directive 82/884/EEC on a limit value for lead in air	Establishes a binding limit value for the concentration of lead in air.	Limit Value	Lead	2µg/m³	annual mean concentration	Compliance by 9 December 1987

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These standards will be replaced by a new regulatory structure based on *Directive 96/62 on ambient air quality assessment and monitoring*, the 'Air Quality Framework Directive' This Directive makes provision for the establishment of new EU-wide air quality objectives through the issuing of 'daughter Directives' covering 12 substances. These Directives will set out 'long-term limit values' (LTLVs) to be met within 10 to 15 years, with interim 'current permitted values' (CPV) also to be set. The process of drawing up the proposed standards is to be carried forward by 12 working groups according to a pre-determined work schedule. The first tranche of proposed standards is to be issued in mid-1997; the last standards should be ready by the end of 1999. The relevant daughter Directives may not enter into force until 2001.

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1.2 TABLE 2: AMBIENT AIR QUALITY STANDARDS - AUSTRALIA

Legislation	Summary	Standards				Comments
		Status	Substance	Value	Reference Period	
ANZEEC National Air Quality Objectives	The ANZEEC objectives do not have statutory force in Australia. However, as the States are obliged to implement ambient air quality objectives, Queensland has adopted the ANZEEC objectives prior to the preparation of new standards. Other states have adopted more stringent standards; the standards in Victoria and Tasmania are set out in two tables below.	Guide Values	Lead	1.5 µg/m³	Three month average	
			Photochemical Oxidants	170 µg/m³ and 0.08 ppm 210 µg/m³ and 0.10 ppm	4 hour average Hourly average	Not to be exceeded more than once per year
			SO_2	60 µg/m³ and 0.02 ppm 570µg/m³ and 0.20 ppm 700 µg/m³ and 0.25 ppm	Annual mean 1 hour average 10 minute average	
			TSP	90 µg/m³	Annual mean	TSP goals to be read in conjunction with annual SO_2 goals
			NO_2	320 µg/m³ and 0.16 ppm	1 hour average	Not to be exceeded more than once per month
			Sulphates	15 µg/m³	Annual mean	
			CO	10 mg/m³ and 9 ppm	8 hour average	Not to be exceeded more than once per year

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1.3 TABLE 2A: AMBIENT AIR QUALITY STANDARDS - AUSTRALIA - VICTORIA

Legislation	Summary	Standards				Comments
		Status	Substance	Value	Reference Period	
State Environment Protection Policy	Part IV of the Policy prescribes ambient air quality standards for the principal air pollutants.	Acceptable level	CO	30 ppm 10 ppm	1 hour 8 hour	Acceptable levels based on health effects, except where indicated.
			NO_2	0.15 ppm 0.06 ppm	1 hour 24 hrs	
			Oxidant	0.12 ppm 0.05 ppm	1 hour 8 hours	Based on vegetation damage.
			SO_2	0.17 ppm 0.06 ppm	1 hour 24 hours	
			Visibility-reducing particulates	20 km	1 hour	Based on aesthetic considerations.
		Detrimental level	CO	60 ppm 20 ppm	1 hour 8 hours	
			NO_2	0.25 ppm 0.15 ppm	1 hour 24 hours	
			Oxidant	0.15 ppm 0.08 ppm	1 hour 8 hours	Based on vegetation damage.
			SO_2	0.34 ppm 0.11 ppm	1 hour 24 hours	
		Limit Value	Lead	1.5 $\mu g/m^3$	Average of three calendar months	

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1.4 TABLE 2B: AMBIENT AIR QUALITY STANDARDS - AUSTRALIA - TASMANIA

Legislation	Summary	Standards				Comments
		Status	Substance	Value	Reference Period	
Environmental Protection Act 1973		Limit Values	SO_2	450µg/m³	1 hour	
				160µg/m³	24 hours	
				50µg/m³	Annual arithmetic mean	
			Gaseous Flourides (expressed as HF)	2.9µg/m³	24 hours	
				0.5µg/m³	90 days	
			Arsenic	3.0µg/m³	24 hours	
			Lead	1.5µg/m³	90 days	
			CO	37.5mg/m³	1 hour	
				12.5mg/m³	8 hours	
			NO_2	0.31µg/m³	1 hour	
				0.12µg/m³	24 hours	

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1.5 TABLE 3: AMBIENT AIR QUALITY STANDARDS - BRAZIL

Legislation	Summary	Standards				Comments
		Status	Substance	Value	Reference Period	
CONAMA Resolution No.3 of 28/6/90	This Resolution established non-mandatory air quality guidelines, specifying primary and secondary standards.	Primary standards	SO_2	365 µg/m³ 80 µg/m³	mean value, 24 hours annual arithmetic mean	24 hours standards expressed in average concentration over 24 hours of µg/m³ of air, not to be exceeded more than once per year.
A copy of CONAMA Resolution No.3 in the original Portuguese is provided in Annex B	Primary standards are the maximum tolerable limits which, if exceeded, could adversely affect human health.		Suspended Particulates	240µg/m³ 80µg/m³	mean value, 24 hours annual geometric mean	Annual standards expressed in average concentration of µg/m³ of air.
			Particles <10 µg/m³	150µg/m³ 50µg/m³	mean value, 24 hours annual arithmetic mean	
			Smoke	150µg/m³ 60µg/m³	mean value, 24 hours annual arithmetic mean	
			CO	35 ppm 9 ppm	1 hour 8 hours	
			Ozone	160µg/m³	1 hour	
			NO_x	320µg/m³ 100µg/m³,	1 hour annual arithmetic mean	
	Secondary standards are set to protect the environment in general.	Secondary standards	SO_2	100µg/m³ 40µg/m³	mean value, 24 hours annual arithmetic mean	
			Suspended Particulates	150µg/m³ 60µg/m³	mean value, 24 hours annual geometric mean	
			Particles <10 µg/m³	150 µg/m³ 50µg/m³	mean value, 24 hours annual arithmetic mean	
			Smoke	100µg/m³ 40µg/m³	mean value, 24 hours annual arithmetic mean	
			CO	35 ppm 9 ppm	1 hour 8 hours	

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Legislation	Summary	Standards				Comments
		Status	Substance	Value	Reference Period	
			Ozone	160µg/m³	1 hour	
			NO_x	190µg/m³	1 hour	
				100µg/m³	annual arithmetic mean	

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1.6 TABLE 4: AMBIENT AIR QUALITY STANDARDS - CHINA

Legislation	Summary	Standards				Comments
		Status	Substance	Value	Reference Period	
Ambient Air Quality Standard GB3095-96	The following standards apply to three air quality function zones. Class I covers 'Nature preserves, scenic areas places of historic interest and areas requiring special protection'.	Limit Values, Class I	SO_2	0.02 mg/m³	Annual mean	
				0.05 mg/m³	Daily mean	
				0.15 mg/m³	Hourly mean	
			TSP	0.08 mg/m³	Annual mean	
				0.12 mg/m³	Daily mean	
			PM_{10}	0.04 mg/m³	Annual mean	
				0.05 mg/m³	Daily mean	
			NO_x	0.05 mg/m³	Annual mean	
				0.10 mg/m³	Daily mean	
				0.15 mg/m³	Hourly mean	
			NO_2	0.04 mg/m³	Annual mean	
				0.08 mg/m³	Daily mean	
				0.12 mg/m³	Hourly mean	
			CO	4.0 mg/m³	Daily mean	
				10.0 mg/m³	Hourly mean	
			O_3	0.12 mg/m³	Hourly mean	
			F	1.8 μg/dm³	Monthly mean	
				1.2 μg/dm³	Quarterly plant growth mean	

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Legislation	Summary	Standards				Comments
		Status	Substance	Value	Reference Period	
	Class II covers 'Urban residential areas, multi-purpose areas commercial, cultural, basic industry and rural areas'.	Limit Values, Class II	SO_2	0.06 mg/m³	Annual mean	
				0.15 mg/m³	Daily mean	
				0.50 mg/m³	Hourly mean	
			TSP	0.20 mg/m³	Annual mean	
				0.30 mg/m³	Daily mean	
			PM_{10}	0.10 mg/m³	Annual mean	
				0.15 mg/m³	Daily mean	
			NO_x	0.05 mg/m³	Annual mean	
				0.10 mg/m³	Daily mean	
				0.15 mg/m³	Hourly mean	
			NO_2	0.04 mg/m³	Annual mean	
				0.08 mg/m³	Daily mean	
				0.12 mg/m³	Hourly mean	
			CO	4.0 mg/m³	Daily mean	
				10.0 mg/m³	Hourly mean	
			O_3	0.16 mg/m³	Hourly mean	
	Class III covers 'Classified industrial zones'.	Limit Values, Class III	SO_2	0.10 mg/m³	Annual mean	
				0.25 mg/m³	Daily mean	
				0.70 mg/m³	Hourly mean	
			TSP	0.30 mg/m³	Annual mean	
				0.50 mg/m³	Daily mean	
			PM_{10}	0.15 mg/m³	Annual mean	
				0.25 mg/m³	Daily mean	
			NO_x	0.10 mg/m³	Annual mean	
				0.15 mg/m³	Daily mean	
				0.30 mg/m³	Hourly mean	

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Legislation	Summary	Standards				Comments
		Status	Substance	Value	Reference Period	
			NO_2	0.08 mg/m³	Annual mean	
				0.12 mg/m³	Daily mean	
				0.24 mg/m³	Hourly mean	
			CO	6.0 mg/m³	Daily mean	
				20.0 mg/m³	Hourly mean	
			O_3	0.16 mg/m³	Hourly mean	
		Limit Values, Classes II and III	F	3.0 µg/dm³	Monthly mean	
				2.0 µg/dm³	Quarterly plant growth mean	
		Limit Values, Classes I, II and III	Lead	1.5 µg/m³	Quarterly mean	
				1.0 µg/m³	Annual mean	
			Benzoapyrene	0.01 µg/m³	Daily mean	

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1.7 TABLE 5: AMBIENT AIR QUALITY STANDARDS - GERMANY

Legislation	Summary	Standards				Comments
		Status	Substance	Value	Reference Period	
Technical Instruction on Air (TA-Luft) 1986	TA-Luft establishes ambient air quality standards which must be observed by the competent authorities in issuing emissions permits.	Limit Values	Suspended Particles	0.15 mg/m³	IW1	IW1 = average annual value
				0.30 mg/m³	IW2	IW2 = 98th percentile of average annual value
A copy of these standards from TA-Luft in the original German is provided in Annex C			Lead	2.0 µg/m³	IW1	
			Cadmium	0.04 µg/m³	IW1	
			Chlorine	0.1 mg/m³	IW1	
				0.3 mg/m³	IW2	
			Hydrochloric Acid	0.1 mg/m³	IW1	
				0.2 mg/m³	IW2	
			Carbon Monoxide	10 mg/m³	IW1	
				30 mg/m³	IW2	
			SO_2	0.14 mg/m³	IW1	
				0.40 mg/m³	IW2	
			NO_x	0.08 mg/m³	IW1	
				0.20 mg/m³	IW2	

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1.8 *TABLE 6: AMBIENT AIR QUALITY STANDARDS - JAPAN*

Legislation	Summary	Standards				Comments
		Status	Substance	Value	Reference Period	
Notification No.25 of 1973	Issued under Article 9 of the Basic Law for Environmental Pollution Control (Law No.132 of 1967), these Notifications establish limit values for a number of substances in the atmosphere	Limit Values	SO_x	0.04ppm	daily average of hourly values	According to the Notification, limit values do not apply to 'exclusive industrial areas, road and other areas or places where people do not usually live'.
				0.1 ppm	one hour value	
			CO	10 ppm	daily average of hourly values	
				20 ppm	one hour value	
			Suspended Particulates	0.10 mg/m³	daily average of hourly values	
				0.20 mg/m³	one hour value	
			Photochemical Oxidants	0.06 ppm,	one hour value	
Notification No.38 of 1978		Limit Values	NO_x	0.04-0.06 ppm,	daily average of hourly values	According to the Notification, the limit value does not apply to 'exclusive industrial areas, road and other areas or places where people do not usually live'.
Notification of 4 February 1997		Guide Values	Benzene	0.003 mg/m³	Annual mean	
			Trichloroethylene	0.2 mg/m³	Annual mean	
			Tetrachloroethylene	0.2 mg/m³	Annual mean	

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1.9 TABLE 7: AMBIENT AIR QUALITY STANDARDS - POLAND

Legislation	Summary	Standards				Comments
		Status	Substance	Value	Reference Period	
Executive Order of the Minister of Environmental Protection (DzU No.15 1992)	Establishing maximum permitted concentrations for 44 substances in air, for regular and specially protected areas.	Regular Area, Limit Values	NO_x	500µg/m³	30 minutes	
				150µg/m³	24 hours	
				50µg/m³	Annual	
A full copy of these standards in the original Polish is provided in Annex D.	For each area, values are given for a 30 minute mean, 24 hour mean, and annual mean concentrations.	--	SO_2	600µg/m³	30 minutes	In force until end of 1998, then to be replaced.
				200µg/m³	24 hours	
				32µg/m³	Annual	
	Values for some of the principal pollutants are presented in this table.		Suspended Particulates	120µg/m³	24 hours	
				50µg/m³	Annual	
	The full list of substances with associated limit values is provided in Annex D.	Specially Protected Areas, Limit Values	NO_x	150µg/m³	30 minutes	
				50µg/m³	24 hours	
				30µg/m³	Annual	
			SO_2	250µg/m³	30 minutes	In force until end of 1998, then to be replaced.
				75µg/m³	24 hours	
				11µg/m³	Annual	
			Suspended Particulates	60µg/m³	24 hours	
				40µg/m³	Annual	

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1.10 TABLE 8: AMBIENT AIR QUALITY STANDARDS - SOUTH KOREA

Legislation	Summary	Standards				Comments
		Status	Substance	Value	Reference Period	
Standards in force from 1 January 1994, unless otherwise stated		Limit Values	SO_2	0.03 ppm	Annual average	
				0.14 ppm	Daily average	Daily average must not be exceeded more than three times in one year
			CO	9 ppm	8 hours average	
				25 ppm	Hourly average	Hourly average must not be exceeded more than three times in one year
			NO_2	0.05 ppm	Annual average	
				0.15 ppm	Hourly average	Hourly average must not be exceeded more than three times in one year
			PM_{10}	80 μg/m³	Annual average	
				150 μg/m³	Daily average	Daily average must not be exceeded more than three times in one year, in force from 1 January 1995
			TSP	150 μg/m³	Annual average	
				300 μg/m³	Daily average	Daily average must not be exceeded more than three times in one year
			O_3	0.06 ppm	8 hourly average	
				0.1 ppm	Hourly average	Hourly average must not be exceeded more than three times in one year
			Pb	1.5 μg/m³	3 month average	

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1.11 TABLE 9: AMBIENT AIR QUALITY STANDARDS - UK

Legislation	Summary	Standards				Comments
		Status	Substance	Value	Reference Period	
Air Quality Standards Regulations 1989 (SI 317/1989)	The Air Quality Standards Regulations 1989 implement the provisions of the following EC Directives: • Directive 80/779 on SO_2 and Suspended Particulates • Directive 85/203 on NO_x	Limit Values	SO_2 Suspended Particulates	Standards set out in Annex E		Regulation 2: 'concentrations of SO_2 and suspended particulates [must not] exceed the limit values given in Annex I to Council Directive 80/779/EEC'
See Annex E for standards relating to SO_2, suspended particulates and NO_x	Rather than duplicate the values set out in the Directives, the Regulations simply refer to the relevant sections of the Directives		NO_x	Standards set out in Annex E		Regulation 6: 'concentrations of NO_x [must not] exceed the limit values given in Annex I to Council Directive 85/203/EEC on air quality standards for NO_x'
	The Regulations also establish a limit value for lead in air.		Lead	2µg/m³	annual mean concentration	
National Air Quality Strategy, draft launched in June 1996	Air quality standards have been designed to protect human health for eight priority substances. These are then translated into targets setting out a timescale within which compliance is to be achieved. The standards set out in this table are to be achieved by 2005.	Limit Values	Benzene	5 ppb	Running annual mean	Full compliance by 2005
			1,3-Butadiene	1 ppb	Running annual mean	Full compliance by 2005
			CO	10 ppb	Running annual mean	Full compliance by 2005
			Lead	0.5µg/m³	Annual mean	Full compliance by 2005
			NO_2	104.6 ppb 20 ppb	1 hour mean Annual mean	99.9th percentile by 2005 99.9th percentile by 2005
			Ozone	50 ppb	Running 8-hour mean	97th percentile by 2005
			PM_{10}	50µg/m³	Running 24-hour mean	99th percentile by 2005
			SO_2	100 ppb	15 minute mean	99.9th percentile by 2005

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Annex A

Ambient Air Quality Standards - EC

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ANNEX I

LIMIT VALUE FOR NITROGEN DIOXIDE

(The value limit shall be expressed in µg/m³. The volume must be standardized at the following conditions of temperature and pressure: 293° K and 101,3 kPa)

Reference period (¹)	Limit value for nitrogen dioxide
Year	200
	98th percentile calculated from the mean values per hour or per period of less than an hour recorded throughout the year (²)

(¹) The annual reference period begins on 1 January in any given calendar year and ends on 31 December.

(²) To ensure that the validity of the calculation of the 98th percentile is recognized, 75 % of the possible values must be available and, as far as possible, distributed uniformly throughout the year in question for that particular measurement site.

In cases where the values measured on certain sites are not available over a period exceeding 10 days, the calculated percentile must mention this fact.

The calculation of the 98th percentile on the basis of the values recorded throughout the year is to be carried out as follows: the 98th percentile must be calculated from the values actually measured. The measured values should be rounded off to the nearest µg/m³. All the values are to be listed in increasing order for each site:

$$X_1 \leqslant X_2 \leqslant X_3 \leqslant \ldots\ldots\ldots\ldots \leqslant X_k \leqslant \ldots\ldots\ldots\ldots \leqslant X_{N-1} \leqslant X_N$$

The 98th percentile is the value of the component of rank k where k is calculated from the following formula:

$$k = (q \times N)$$

where q is equal to 0,98 for the 98th percentile and to 0,50 for the 50th percentile, N being the number of values actually measured. The value of (q × N) should be rounded off to the nearest whole number.

Where measuring equipment does not yet allow the production of discrete values but provides only classes of values higher than 1 µg/m³, the Member State concerned may, for the calculation of the percentile, use an interpolation, provided that the interpolation formula is accepted by the Commission and that the classes of values are not higher than 10 µg/m³. This temporary waiver is only valid for equipment currently installed for a time span not exceeding the life of the equipment and in any case limited to 10 years from the application of this Directive.

ANNEX II

GUIDE VALUES FOR NITROGEN DIOXIDE

(The value limit shall be expressed in µg/m³. The volume must be standardized at the following conditions of temperature and pressure: 293° K and 101,3 kPa)

Reference period	Guide values for nitrogen dioxide
Year	50
	50th percentile calculated from the mean values per hour or per period of less than an hour recorded throughout the year
	135
	98th percentile calculated from the mean values per hour or per period of less than an hour recorded throughout the year

The formula given in footnote (²) of Annex I must be used in calculating these percentiles, the value of q being 0,50 for the 50th percentile and 0,98 for the 98th percentile.

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ANNEX I

LIMIT VALUES FOR SULPHUR DIOXIDE AND SUSPENDED PARTICULATES

(As measured by the black-smoke method)

TABLE A

Limit values for sulphur dioxide expressed in µg/m³ with the associated values for suspended particulates (as measured by the black-smoke method (¹)) expressed in µg/m³

Reference period	Limit value for sulphur dioxide	Associated value for suspended particulates
Year	80 (median of daily mean values taken throughout the year)	> 40 (median of daily mean values taken throughout the year)
	120 (median of daily mean values taken throughout the year)	≤ 40 (median of daily mean values taken throughout the year)
Winter (1 October to 31 March)	130 (median of daily mean values taken throughout the winter)	> 60 (median of daily mean values taken throughout the winter)
	180 (median of daily mean values taken throughout the winter)	≤ 60 (median of daily mean values taken throughout the winter)
Year (made up of units of measuring periods of 24 hours)	250 (²) (98 percentile of all daily mean values taken throughout the year)	> 150 (98 percentile of all daily mean values taken throughout the year)
	350 (²) (98 percentile of all daily mean values taken throughout the year)	≤ 150 (98 percentile of all daily mean values taken throughout the year)

(¹) The results of the measurements of black smoke taken by the OECD method have been converted into gravimetric units as described by the OECD (see Annex III)

(²) Member States must take all appropriate steps to ensure that this value is not exceeded for more than three consecutive days. Moreover, Member States must endeavour to prevent and to reduce any such instances in which this value has been exceeded.

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TABLE B

Limit values for suspended particulates (as measured by the black-smoke method [1]) expressed in $\mu g/m^3$

Reference period	Limit value for suspended particulates
Year	80 (median of daily mean values taken throughout the year)
Winter (1 October to 31 March)	130 (median of daily mean values taken throughout the winter)
Year (made up of units of measuring periods of 24 hours)	250 [2] (98 percentile of all daily mean values taken throughout the year)

[1] The results of the measurements of black smoke taken by the OECD method have been converted into gravimetric units as described by the OECD (see Annex III).

[2] Member States must take all appropriate steps to ensure that this value is not exceeded for more than three consecutive days. Moreover, Member States must endeavour to prevent and to reduce any such instances in which this value has been exceeded.

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Source: https://www.industrydocuments.ucsf.edu/docs/nzdj0001

ANNEX II

GUIDE VALUES FOR SULPHUR DIOXIDE AND SUSPENDED PARTICULATES

(as measured by the black-smoke method)

TABLE A

(Guide values for sulphur dioxide expressed in $\mu g/m^3$

Reference period	Guide value for sulphur dioxide
Year	40 to 60 (arithmetic mean of daily mean values taken throughout the year)
24 hours	100 to 150 (daily mean value)

TABLE B

Guide values for suspended particulates (as measured by the black-smoke method (1)) expressed in $\mu g/m^3$

Reference period	Guide value for suspended particulates
Year	40 to 60 (arithmetic mean of daily mean values taken throughout the year)
24 hours	100 to 150 (daily mean value)

(1) The results of the measurements of black smoke taken by the OECD method have been converted into gravimetric units as described by the OECD (see Annex III).

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Source: https://www.industrydocuments.ucsf.edu/docs/nzdj0001

ANNEX I

THRESHOLDS FOR OZONE CONCENTRATIONS IN THE AIR (*)

(The values are expressed in µg O_3/m^3. The volume must be standardized at the following conditions of temperature and pressure: 293 °K and 101,3 kPa)

1. **Health protection threshold**

   110 µg/m³ for the mean value over eight hours (**)

2. **Vegetation protection thresholds**

   200 µg/m³ for the mean value over one hour

   65 µg/m³ for the mean value over 24 hours

3. **Population information threshold**

   180 µg/m³ for the mean value over one hour

4. **Population warning threshold**

   360 µg/m³ for the mean value over one hour

(*) Concentrations must be measured continuously.

(**) The mean over eight hours is a non-overlapping moving average; it is calculated four times a day from the eight hourly values between 0 and 9.00, 8.00 and 17.00, 16.00 and 1.00, 12.00 and 21.00. For the information to be provided pursuant to Article 6 (1), first indent, the mean over eight hours is a simple moving average, calculated each hour h from the eight hourly values between h and h-9.

PM3006566366

Source: https://www.industrydocuments.ucsf.edu/docs/nzdj0001

Annex B

Ambient Air Quality Standards - Brazil

PM3006566367

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SECRETARIA DO MEIO AMBIENTE

Conselho Nacional do Meio Ambiente

RESOLUÇÃO Nº 03, DE 28 DE JUNHO DE 1990

O CONSELHO NACIONAL DO MEIO AMBIENTE-CONAMA, no uso das ições que lhe confere o inciso II, do art. 6º, da Lei nº 7.804, de julho de 1989, e tendo em vista o disposto na Lei nº 8.028, de abril de 1990, Decreto nº 99.274, de 06 de junho de 1990 e,

Considerando a necessidade de ampliar o número de poluentes éricos passíveis de monitoramento e controle no País;

Considerando que a Portaria GM 0231, de 27.04.76, previa o iscimento de novos padrões de qualidade do ar quando houvesse ição científica a respeito;

Considerando o previsto na Resolução CONAMA nº 05, de 89, que instituiu o Programa Nacional de Controle de Qualidade do AR, resolve:

Art. 1º São padrões de qualidade do ar as concentrações de tos atmosféricos que, ultrapassados, poderão afetar a saúde, a ça e o bem-estar da população, bem como ocasionar danos à flora ma, aos materiais e ao meio ambiente em geral.

Parágrafo Único. Entende-se como poluente atmosférico tt forma de matéria ou energia com intensidade e em quantidade, ração, tempo ou características em desacordo com os níveis lecidos, e que tornem ou possam tornar o ar;

I - impróprio, nocivo ou ofensivo à saúde;

II - inconveniente ao bem-estar público;

III - danoso aos materiais, à fauna e flora;

IV - prejudicial à segurança, ao uso e gozo da propriedade e às atividades normais da comunidade.

Art. 2º Para os efeitos desta Resolução ficam estabelecidos uintes conceitos:

I - Padrões Primários de Qualidade do Ar são as concentrações de poluentes que, ultrapassadas, poderão afetar a saúde da população.

II - Padrões Secundários de Qualidade do Ar são as concentrações de poluentes abaixo das quais se prevê o mínimo efeito adverso sobre o bem-estar da população, assim como o mínimo dano à fauna, à flora, aos materiais e ao meio ambiente em geral.

Parágrafo Único. Os padrões de qualidade do ar serão o e ser atingido mediante à estratégia de controle fixada pelos de emissão e deverão orientar a elaboração de Planos Regionais ole de Poluição do Ar.

Art. 3º Ficam estabelecidos os seguintes Padrões de Qualidade

I - Partículas Totais em Suspensão

a) Padrão Primário

1 - concentração média geométrica anual de 80 (oitenta) microgramas por metro cúbico de ar.

2 - concentração média de 24 (vinte e quatro) horas de 240 (duzentos e quarenta) microgramas por metro cúbico de ar, que não deve ser excedida mais de uma vez por ano.

b) Padrão Secundário

1 - concentração média geométrica anual de 60 (sessenta) microgramas por metro cúbico de ar.

2 - concentração média de 24 (vinte e quatro) horas de 150 (cento e cinqüenta) microgramas por metro cúbico de ar, que não deve ser excedida mais de uma vez por ano.

II - Fumaça

a) Padrão Primário

1 - concentração média aritmética anual de 60 (sessenta) microgramas por metro cúbico de ar.

2 - concentração média de 24 (vinte e quatro) horas de 150 (cento e cinqüenta) microgramas por metro cúbico de ar, que não deve ser excedida mais de uma vez por ano.

b) Padrão Secundário

1 - concentração média aritmética anual de 40 (quarenta) microgramas por metro cúbico de ar.

2 - concentração média de 24 (vinte e quatro) horas de 100 (cem) microgramas por metro cúbico de ar, que não deve ser excedida mais de uma vez por ano.

III - Partículas Inaláveis

a) Padrão Primário e Secundário

1 - concentração média aritmética anual de 50 (cinqüenta) microgramas por metro cúbico de ar.

2 - concentração média de 24 (vinte e quatro) horas de 150 (cento e cinqüenta) microgramas por metro cúbico de ar, que não deve ser excedida mais de uma vez por ano.

IV - Dióxido de Enxofre

a) Padrão Primário

1 - concentração média aritmética anual de 80 (oitenta) microgramas por metro cúbico de ar.

2 - concentração média de 24 (vinte e quatro) horas de 365 (trezentos e sessenta e cinco) microgramas por metro cúbico de ar, que não deve ser excedida mais de uma vez por ano.

b) Padrão Secundário

1 - concentração média aritmética anual de 40 (quarenta) microgramas por metro cúbico de ar.

2 - concentração média de 24 (vinte e quatro) horas de 100 (cem) microgramas por metro cúbico de ar, que não deve ser excedida mais de uma vez por ano.

V - Monóxido de Carbono

a) Padrão Primário e Secundário

1 - concentração média de 8 (oito) horas de 10.000 (dez mil) microgramas por metro cúbico de ar (9 ppm), que não deve ser excedida mais de uma vez por ano.

2 - concentração média de 1 (uma) hora de 40.000 (quarenta mil) microgramas por metro cúbico de ar (35 ppm), que não deve ser excedida mais de uma vez por ano.

VI - Ozônio

a) Padrão Primário e Secundário

1 - concentração média de 1 (uma) hora de 160 (cento e sessenta) microgramas por metro cúbico de ar, que não deve ser excedida mais de uma vez por ano.

VII - Dióxido de Nitrogênio

a) Padrão Primário

1 - concentração média aritmética anual de 100 (cem) microgramas por metro cúbico de ar.

2 - concentração média de 1 (uma) hora de 320 (trezentos e vinte) microgramas por metro cúbico de ar.

b) Padrão Secundário

1 - concentração média aritmética anual de 100 (cem) microgramas por metro cúbico de ar.

2 - concentração média de 1 (uma) hora de 190 (cento e noventa) microgramas por metro cúbico de ar.

Art. 3º Ficam estabelecidos os seguintes métodos de amostragem e análise dos poluentes atmosféricos a serem definidos nas respectivas Instruções Normativas:

a) Partículas Totais em Suspensão - Método do Amostrador de Grandes Volumes ou Método Equivalente.

b) Fumaça - Método da Refletância ou Método Equivalente.

c) Partículas Inaláveis - Método de Separação Inercial/Filtração ou Método Equivalente.

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) Dióxido de Enxofre - Método de Pararosanilina ou Método Equivalente.

) Monóxido de Carbono - Método do Infra-Vermelho não Dispersivo ou Método Equivalente.

) Ozônio - Método da Quimiluminescência ou Método Equivalente.

) Dióxido de Nitrogênio - Método da Quimiluminescência ou Método Equivalente.

1º Constitui-se Método de Referência, os métodos aprovados tituto Nacional de Metrologia, Normalização e Qualidade INMETRO e na ausência deles os recomendados pelo IBAMA como quados e que deve ser utilizado preferencialmente.

2º Poderão ser adotados métodos equivalentes aos métodos de desde que aprovados pelo IBAMA.

3º Ficam definidas como condições de referência a de 25°C e a pressão de 760 milímetros de coluna de mercúrio libares).

rt. 4º O monitoramento da qualidade do ar é atribuição dos

rt. 5º Ficam estabelecidos os Níveis de Qualidade do Ar para do Plano de Emergência para Episódios Críticos de Poluição endo providências dos governos de Estado e dos Municípios, de entidades privadas e comunidade geral, com o objetivo de ave e iminente risco à saúde da população.

§ 1º Considera-se Episódio Crítico de Poluição do Ar a lc altas concentrações de poluentes na atmosfera em curto tempo, resultante da ocorrência de condições meteorológicas is à dispersão dos mesmos.

§ 2º Ficam estabelecidos os Níveis de Atenção, Alerta e para a execução do Plano.

§ 3º Na definição de qualquer dos níveis enumerados poderão radas concentrações de dióxido de enxofre, partículas totais ão, produto entre partículas totais em suspensão e dióxido de xidio de carbono, ozônio, partículas inaláveis, fumaça, de nitrogênio, bem como a previsão ica e os fatos e fatores intervenientes previstos e

§ 4º As providências a serem tomadas a partir da ocorrência de Atenção e de Alerta tem por objetivo evitar o atingimento lc Emergência.

§ 5º O Nível de Atenção será declarado quando, prevendo-se a das emissões, bem como condições cas desfavoráveis à dispersão dos poluentes nas 24 (vinte e cas subseqüentes, for atingida uma ou mais das condições a eradas:

) concentração de dióxido de enxofre (SO_2), média de 24 (vinte e quatro) horas, de 800 (oitocentos) microgramas por metro cúbico;

) concentração de partículas totais em suspensão, média de 24 (vinte e quatro) horas, de 375 (trezentos e setenta e cinco) microgramas por metro cúbico;

) produto, igual a 65 X 10^3, entre a concentração de dióxido de enxofre (SO_2) e a concentração de partículas totais em suspensão - ambas em microgramas por metro cúbico, média de 24 (vinte e quatro) horas;

) concentração de monóxido de carbono (CO), média de 08 (oito) horas, de 17.000 (dezessete mil) microgramas por metro cúbico (15 ppm);

) concentração de ozônio, média de 1 (uma) hora, de 400 (quatrocentos) microgramas por metro cúbico;

) concentração de partículas inaláveis, média de 24 (vinte e quatro) horas, de 250 (duzentos e cinqüenta) microgramas por metro cúbico.

) concentração de fumaça, média de 24 (vinte e quatro) horas, de 250 (duzentos e cinqüenta) microgramas por metro cúbico.

) concentração de dióxido de nitrogênio (NO_2), média de 1 (uma) hora, de 1130 (hum mil cento e trinta) microgramas por metro cúbico.

§ 6º O Nível de Alerta será declarado quando, prevendo-se a das emissões, bem como condições meteorológicas is à dispersão de poluentes nas 24 (vinte e quatro) horas for atingida uma ou mais das condições a seguir

) concentração de dióxido de enxofre (SO_2), média de 24 (vinte e quatro) horas, 1.600 (hum mil e seiscentos) microgramas por metro cúbico;

) concentração de partículas totais em suspensão, média de 24 (vinte e quatro) horas, de 625 (seiscentos e vinte e cinco) microgramas por metro cúbico;

c) produto, igual a 261 X 10^3, entre a concentração de dióxido de enxofre (SO_2) e a concentração de partículas totais em suspensão - ambas em microgramas por metro cúbico, média de 24 (vinte e quatro) horas;

d) concentração de monóxido de carbono (CO), média de 8 (oito) horas, de 34.000 (trinta e quatro mil) microgramas por metro cúbico (30 ppm);

e) concentração de ozônio, média de 1 (uma) hora, de 800 (oitocentos) microgramas por metro cúbico;

f) concentração de partículas inaláveis, média de 24 (vinte e quatro) horas, de 420 (quatrocentos e vinte) microgramas por metro cúbico.

g) concentração de fumaça, média de 24 (vinte e quatro) horas, de 420 (quatrocentos e vinte) microgramas por metro cúbico.

h) concentração de dióxido de nitrogênio (NO_2), média de 1 (uma) hora de 2260 (dois mil duzentos e sessenta) microgramas por metro cúbico:

§ 7º O Nível de Emergência será declarado quando, prevendo-se a manutenção das emissões, bem como condições meteorológicas desfavoráveis à dispersão dos poluentes nas 24 (vinte e quatro) horas subseqüentes, for atingida uma ou mais das condições a seguir enumeradas:

a) concentração de dióxido de enxofre (SO_2), média de 24 (vinte e quatro) horas, de 2.100 (dois mil e cem) microgramas por metro cúbico;

b) concentração de partículas totais em suspensão, média de 24 (vinte e quatro) horas, de 875 (oitocentos e setenta e cinco) microgramas por metro cúbico;

c) produto, igual a 393 X 10^3, entre a concentração de dióxido de enxofre (SO_2) e a concentração de partículas totais em suspensão - ambas em microgramas por metro cúbico, média de 24 (vinte e quatro) horas;

d) concentração de monóxido de carbono (CO), média de 8 (oito) horas, de 46.000 (quarenta e seis mil) microgramas por metro cúbico (40 ppm);

e) concentração de ozônio, média de 1 (uma) hora, de 1.000 (hum mil) microgramas por metro cúbico;

f) concentração de partículas inaláveis, média de 24 (vinte e quatro) horas, de 500 (quinhentos) microgramas por metro cúbico;

g) concentração de fumaça, média de 24 (vinte e quatro) horas, de 500 (quinhentos) microgramas por metro cúbico;

h) concentração de dióxido de nitrogênio (NO_2), média de 1 (uma) hora, de 3.000 (três mil) microgramas por metro cúbico.

§ 8º Cabe aos Estados a competência para indicar as autoridades responsáveis pela declaração dos diversos níveis, devendo as declarações efetuar-se por qualquer dos meios usuais de comunicação de massa.

§ 9º Durante a permanência dos níveis acima referidos, as fontes de poluição do ar ficarão, na área atingida, sujeitas às restrições previamente estabelecidas pelo órgão de controle ambiental.

Art. 6º Outros Padrões de Qualidade do Ar para poluentes, além dos aqui previstos, poderão ser estabelecidos pelo CONAMA, se isto vier a ser julgado necessário.

Art. 7º Enquanto cada Estado não definir as áreas de Classe I, II e III mencionadas no item 2, subitem 2.3, da Resolução/ CONAMA/nº 005/89, serão adotados os padrões primários de qualidade do ar estabelecidos nesta Resolução.

Art. 8º Esta Resolução entra em vigor na data de sua publicação, revogadas as disposições em contrário.

TÂNIA MARIA TONELLI MUNHOZ
Secretária-Executiva do CONAMA

JOSÉ ANTONIO LUTZENBERGER
Presidente do CONAMA

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Annex C

Ambient Air Quality Standards - Germany

PM3006566370

Source: https://www.industrydocuments.ucsf.edu/docs/nzdj0001

Bei der Bestimmung der Schornsteinhöhe ist eine unebene Geländeform zu berücksichtigen, wenn die Anlage in einem Tal liegt oder die Ausbreitung der Emissionen durch Geländeerhebungen gestört wird. In den Fällen, in denen die Voraussetzungen für eine Anwendung der VDI-Richtlinie 3781 Blatt 2 (Ausgabe August 1981) vorliegen, ist die nach 2.4.3 und 2.4.4 Abs. 1 bestimmte Schornsteinhöhe entsprechend zu korrigieren.

(Nr. 2.4.4 wurde 1986 redaktionell überarbeitet.)

2.5 *Immissionswerte*

Die Immissionswerte gelten nur in Verbindung mit den in 2.6 festgelegten Verfahren zur Ermittlung der Immissionskenngrößen. Die Festlegung der Immissionswerte berücksichtigt einen Unsicherheitsbereich bei der Ermittlung der Kenngrößen. Die Immissionswerte gelten auch bei gleichzeitigem Auftreten sowie chemischer oder physikalischer Umwandlung der Schadstoffe.

2.5.1 Immissionswerte zum Schutz vor Gesundheitsgefahren

Zum Schutz vor Gesundheitsgefahren werden folgende Immissionswerte festgelegt:

Schadstoff	IW 1	IW 2	
Schwebstaub (ohne Berücksichtigung der Staubinhaltstoffe)	0,15	0,30	mg/m³
Blei und anorganische Bleiverbindungen als Bestandteile des Schwebstaubes — angegeben als Pb —	2,0	—	µg/m³
Cadmium und anorganische Cadmiumverbindungen als Bestandteile des Schwebstaubes — angegeben als Cd —	0,04	—	µg/m³
Chlor	0,10	0,30	mg/m³
Chlorwasserstoff — angegeben als Cl —	0,10	0,20[1])	mg/m³
Kohlenmonoxid	10	30	mg/m³
Schwefeldioxid	0,14	0,40	mg/m³
Stickstoffdioxid	0,08	0,20	mg/m³

[1]) Solange Chlorwasserstoff nicht einwandfrei getrennt von Chloriden gemessen werden kann, gilt für JW 2 0,30 mg/m³.

PM3006566371

Source: https://www.industrydocuments.ucsf.edu/docs/nzdj0001

Annex D

Ambient Air Quality Standards - Poland

PM3006566372

Source: https://www.industrydocuments.ucsf.edu/docs/nzdj0001

Table 7.1. Permitted concentrations of air pollutants for regular and specially protected areas

No.	Substances	Concentrations ($\mu g/m^3$)					
		Regular areas			Specially protected areas		
		30 min.	24 h	annual average	30 min.	24 h	annual average
1	2	3	4	5	6	7	8
1	Acrylonitryle	-	2.0	0.5	-	2.0	0.5
2	Acetic aldehyde	20.0	10.0	2.5	10.0	5.0	1.3
3	Methyl alcohol	1000.0	500.0	130.0	200.0	100.0	25.0
4	Ammonia	400.0	200.0	51.0	100.0	50.0	13.0
5	Aniline	50.0	30.0	10.0	20.0	10.0	2.5
6	Arsenic	-	0.05	0.01	-	0.05	0.01
7	Asbestos [fibres/m^3]	-	1000.0	-	-	1000.0	-
8	Nitrates	200.0	100.0	25.0	50.0	30.0	10.0
9	Nitrogen dioxide	500.0	150.0	50.0	150.0	50.0	30.0
10	Benzene	-	10.0	2.5	-	10.0	2.5
11	Benzo(a)pirene	-	5.0	1.0	-	5.0	1.0
12	Chlorine	100.0	30.0	4.3	30.0	10.0	1.6
13	Vinyl chloride	-	5.0	1.3	-	3.0	0.4
14	Chromium	-	2.0	0.4	-	0.5	0.08
15	Hydrogen cyjanide and cyjanides	20.0	10.0	2.5	10.0	5.0	1.3
16	Tetrachloroethylene	600.0	300.0	70.0	200.0	120.0	30.0
17	Dichloromethane	400.0	150.0	60.0	100.0	60.0	15.0
18	1-,2-Dichloroethane	400.0	150.0	60.0	100.0	60.0	15.0
19	Carbon disulphide	50.0	20.0	3.8	15.0	4.5	0.6
20	Phenol	20.0	10.0	2.5	10.0	3.0	0.4
21	Fluorine	30.0	10.0	1.6	10.0	3.0	0.4
22	Formaldehyde	50.0	20.0	3.8	20.0	10.0	2.5
23	Phthalanes	100.0	50.0	13.0	30.0	10.0	1.6
24	Cadmium	-	0.22	0.01	-	0.2	0.001
25	Xylene	300.0	100.0	16.0	40.0	10.0	1.3
26	Sulfuric acid	200.0	100.0	16.0	100.0	50.0	7.9
27	Hydrochloric acid	200.0	100.0	20.0	100.0	50.0	10.0
28	Manganese	-	4.0	1.0	-	2.0	0.5
29	Copper	20.0	5.0	0.6	6.0	2.0	0.3
30	Nickel	-	100.0	25.0	-	100.0	25.0
31	Nitrobenzene	50.0	30.0	10.0	20.0	10.0	2.5
32	Vinyl acetate	100.0	-	-	50.0	-	-
33	Lead	-	1.0	0.2	-	0.5	0.1
34	Ozone	100.0	30.0	-	50.0	20.0	-
35	Suspended particulate	-	120.0	50.0	-	60.0	40.0
36	Mercury	-	0.3	0.04	-	0.1	0.02
37	Sulfur dioxide: up to 1998 from 1999	600.0 440.0	200.0 150.0	32.0 32.0	250.0 150.0	75.0 75.0	11.0 11.0
38	Hydrogen sulfide	30.0	5.0	1.0	4.0	1.0	0.5
39	Styrene	20.0	-	-	10.0	-	-
40	Carbon monoxide	5000.0	1000.0	120.0	3000.0	500.0	61.0
41	Toluene	300.0	200.0	50.0	100.0	50.0	13.0
42	Trichloroethylene	400.0	150.0	60.0	50.0	10.0	1.2
43	Vanadium	-	1.0	0.25	-	0.1	0.001
44	Carbon (elemental)	150.0	50.0	8.0	50.0	20.0	4.0

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Source: https://www.industrydocuments.ucsf.edu/docs/nzdj0001

§ 7. Przepisy dotyczące jednostek organizacyjnych stosuje się odpowiednio do osób fizycznych prowadzących działalność gospodarczą.

§ 8. Ilekroć w rozporządzeniu jest mowa o terenowym organie administracji państwowej stopnia wojewódzkiego, rozumie się przez to terenowy organ administracji państwowej o właściwości szczególnej do spraw ochrony środowiska stopnia wojewódzkiego.

§ 9. Sprawy wszczęte i nie zakończone decyzją ostateczną przed dniem wejścia w życie rozporządzenia rozpatruje się według niniejszego rozporządzenia.

§ 10. Traci moc rozporządzenie Rady Ministrów z dnia 30 września 1980 r. w sprawie ochrony powietrza atmosferycznego przed zanieczyszczeniem (Dz. U. Nr 24, poz. 89).

§ 11. Rozporządzenie wchodzi w życie po upływie 14 dni od dnia ogłoszenia.

Załącznik nr 1

DOPUSZCZALNE STĘŻENIA SUBSTANCJI ZANIECZYSZCZAJĄCYCH POWIETRZE

Lp.	Nazwa substancji	Dopuszczalne stężenia zanieczyszczeń w $\mu g/m^3$					
		Obszary			obszary specjalnie chronione		
		30 min	24 h	średnio-roczne	30 min	24 h	średnio-roczne
1	2	3	4	5	6	7	8
1	akrylonitryl[1]	—	2,0	0,5	—	2,0	0,5
2	aldehyd octowy	20,0	10,0	2,5	10,0	5,0	1,3
3	alkohol metylowy	1000,0	500,0	130,0	200,0	100,0	25,0
4	amoniak NH_4	400,0	200,0	51,0	100,0	50,0	13,0
5	anilina	50,0	30,0	10,0	20,0	10,0	2,5
6	arsen[2] As	—	0,05	0,01	—	0,05	0,01
7	azbest[3] [włókien/m^3]	—	1000,0	—	—	1000,0	—
8	azotany[4] NO_3	200,0	100,0	25,0	50,0	30,0	10,0
9	azotu dwutlenek NO_2	500,0	150,0	50,0	150,0	50,0	30,0
10	benzen	—	10,0	2,5	—	10,0	2,5
11	benzo/a/piren [ng/m^3]	—	5,0	1,0	—	5,0	1,0
12	chlor Cl	100,0	30,0	4,3	30,0	10,0	1,6
13	chlorek winylu CV	—	5,0	1,3	—	3,0	0,4

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1	2	3	4	5	6	7	8
14	chrom[5] CR	—	2,0	0,4	—	0,5	0,08
15	cyjanowodór i cyjanki[6] CN	20,0	10,0	2,5	10,0	5,0	1,3
16	czterochloroetylen TCE	600,0	300,0	70,0	200,0	120,0	30,0
17	dwuchlorometan DCM	400,0	150,0	60,0	100,0	60,0	15,0
18	1-, 2-dwuchloroetan DCE	400,0	150,0	60,0	100,0	60,0	15,0
19	dwusiarczek węgla CS_2	50,0	20,0	3,8	15,0	4,5	0,6
20	fenol	20,0	10,0	2,5	10,0	3,0	0,4
21	fluor[7] F	30,0	10,0	1,6	10,0	3,0	0,4
22	formaldehyd	50,0	20,0	3,8	20,0	10,0	2,5
23	ftalany	100,0	50,0	13,0	30,0	10,0	1,6
24	kadm[8] Cd	—	0,22	0,01	—	0,2	0,001
25	ksylen Xylene	300,0	100,0	16,0	40,0	10,0	1,3
26	kwas siarkowy[9] H_2SO_4	200,0	100,0	16,0	100,0	50,0	7,9
27	kwas solny[10] HCl	200,0	100,0	20,0	100,0	50,0	10,0
28	mangan[11] Mn	—	4,0	1,0	—	2,0	0,5
29	miedź[12] Cu	20,0	5,0	0,6	6,0	2,0	0,3
30	nikiel[13] Ni	—	100,0	25,0	—	100,0	25,0
31	nitrobenzen	50,0	30,0	10,0	20,0	10,0	2,5
32	octan winylu Vacetate	100,0	—	—	50,0	—	—
33	ołów[14] Pb	—	1,0	0,2	—	0,5	0,1
34	ozon	100,0	30,0	—	50,0	20,0	—
35	pył zawieszony Dust	—	120,0	50,0	—	60,0	40,0
36	rtęć[15] Hg	—	0,3	0,04	—	0,1	0,02
37	siarki dwutlenek: SO_2						
	stałe do roku 1998	600,0	200,0	32,0	250,0	75,0	11,0
	stałe od roku 1999	440,0	150,0	32,0	150,0	75,0	11,0
38	siarkowodór H_2S	30,0	5,0	1,0	4,0	1,0	0,5
39	styren	20,0	—	—	10,0	—	—
40	tlenek węgla CO	5000,0	1000,0	120,0	3000,0	500,0	61,0
41	toluen	300,0	200,0	50,0	100,0	50,0	13,0
42	trójchloroetylen TCE	400,0	150,0	60,0	50,0	10,0	1,2
43	wanad[16] V	—	1,0	0,25	—	0,1	0,0005
44	węgiel elementarny C	150,0	50,0	8,0	50,0	20,0	4,0

Dopuszczalne stężenia substancji zanieczyszczających powietrze uważa się za dotrzymane, jeżeli ich wartości podane w tabeli w rubrykach 3, 4, 6, 7 są przekroczone co najwyżej dwukrotnie w ciągu 0,2% czasu w roku dla stężeń 30-minutowych i w ciągu 2% czasu w roku dla stężeń średniodobowych.

1) Jako aerozol
2) W pyle zawieszonym
3) W pyle zawieszonym
4) Związki jako NO_3 w pyle zawieszonym
5) Na stopniu utlenienia +6 w pyle zawieszonym
6) Związki jako HCN
7) Jako suma fluoru i fluorków rozpuszczalnych w wodzie

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Annex E

Ambient Air Quality Standards - UK

PM3006566376

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ANNEX I

LIMIT VALUE FOR NITROGEN DIOXIDE

(The value limit shall be expressed in µg/m³. The volume must be standardized at the following conditions of temperature and pressure: 293° K and 101,3 kPa)

Reference period (¹)	Limit value for nitrogen dioxide
Year	200
	98th percentile calculated from the mean values per hour or per period of less than an hour recorded throughout the year (²)

(¹) The annual reference period begins on 1 January in any given calendar year and ends on 31 December.

(²) To ensure that the validity of the calculation of the 98th percentile is recognized, 75 % of the possible values must be available and, as far as possible, distributed uniformly throughout the year in question for that particular measurement site.

In cases where the values measured on certain sites are not available over a period exceeding 10 days, the calculated percentile must mention this fact.

The calculation of the 98th percentile on the basis of the values recorded throughout the year is to be carried out as follows: the 98th percentile must be calculated from the values actually measured. The measured values should be rounded off to the nearest µg/m³. All the values are to be listed in increasing order for each site:

$$X_1 \leqslant X_2 \leqslant X_3 \leqslant \ldots\ldots\ldots\ldots \leqslant X_k \leqslant \ldots\ldots\ldots\ldots \leqslant X_{N-1} \leqslant X_N$$

The 98th percentile is the value of the component of rank k where k is calculated from the following formula:

$$k = (q \times N)$$

where q is equal to 0,98 for the 98th percentile and to 0,50 for the 50th percentile, N being the number of values actually measured. The value of (q × N) should be rounded off to the nearest whole number.

Where measuring equipment does not yet allow the production of discrete values but provides only classes of values higher than 1 µg/m³, the Member State concerned may, for the calculation of the percentile, use an interpolation, provided that the interpolation formula is accepted by the Commission and that the classes of values are not higher than 10 µg/m³. This temporary waiver is only valid for equipment currently installed for a time span not exceeding the life of the equipment and in any case limited to 10 years from the application of this Directive.

ANNEX II

GUIDE VALUES FOR NITROGEN DIOXIDE

(The value limit shall be expressed in µg/m³. The volume must be standardized at the following conditions of temperature and pressure: 293° K and 101,3 kPa)

Reference period	Guide values for nitrogen dioxide
Year	50
	50th percentile calculated from the mean values per hour or per period of less than an hour recorded throughout the year
	135
	98th percentile calculated from the mean values per hour or per period of less than an hour recorded throughout the year

The formula given in footnote (²) of Annex I must be used in calculating these percentiles, the value of q being 0,50 for the 50th percentile and 0,98 for the 98th percentile.

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ANNEX I

LIMIT VALUES FOR SULPHUR DIOXIDE AND SUSPENDED PARTICULATES

(As measured by the black-smoke method)

TABLE A

Limit values for sulphur dioxide expressed in µg/m³ with the associated values for suspended particulates (as measured by the black-smoke method [1]) expressed in µg/m³

Reference period	Limit value for sulphur dioxide	Associated value for suspended particulates
Year	80 (median of daily mean values taken throughout the year)	> 40 (median of daily mean values taken throughout the year)
	120 (median of daily mean values taken throughout the year)	≤ 40 (median of daily mean values taken throughout the year)
Winter (1 October to 31 March)	130 (median of daily mean values taken throughout the winter)	> 60 (median of daily mean values taken throughout the winter)
	180 (median of daily mean values taken throughout the winter)	≤ 60 (median of daily mean values taken throughout the winter)
Year (made up of units of measuring periods of 24 hours)	250 [2] (98 percentile of all daily mean values taken throughout the year)	> 150 (98 percentile of all daily mean values taken throughout the year)
	350 [2] (98 percentile of all daily mean values taken throughout the year)	≤ 150 (98 percentile of all daily mean values taken throughout the year)

[1] The results of the measurements of black smoke taken by the OECD method have been converted into gravimetric units as described by the OECD (see Annex III).

[2] Member States must take all appropriate steps to ensure that this value is not exceeded for more than three consecutive days. Moreover, Member States must endeavour to prevent and to reduce any such instances in which this value has been exceeded.

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II

(Preparatory Acts)

COMMISSION

Proposal for a Council Directive relating to limit values for benzene and carbon monoxide in ambient air

(1999/C 53/07)

(Text with EEA relevance)

COM(1998) 591 final — 98/0333(SYN)

(Submitted by the Commission on 20 January 1999)

THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 130s(1) thereof,

Having regard to the proposal from the Commission,

Having regard to the opinion of the Economic and Social Committee,

Having regard to the opinion of the Committee of the Regions,

Acting in accordance with the procedure laid down in Article 189c of the Treaty, in cooperation with the European Parliament,

(1) Whereas, on the basis of principles enshrined in Article 130r of the Treaty, the European Community programme of policy and action in relation to the environment and sustainable development (the Fifth Environment Action Programme) [1] envisages in particular amendments to legislation on air pollutants; whereas that programme recommends the establishment of long-term objectives on air quality; whereas Article 130r of the Treaty requires the precautionary principle to be applied in relation to the protection of human health and the environment;

(2) Whereas Article 129 of the Treaty provides that health-protection requirements shall form a constituent part of the Community's other policies; whereas point (o) of Article 3 of the Treaty provides that the activities of the Community are to include a contribution to the attainment of a high level of health protection;

(3) Whereas, pursuant to Article 4(5) of Council Directive 96/62/EC of 27 September 1996 on ambient air quality assessment and management [2], the Council is to adopt the legislation provided for in paragraph 1 as well as the provisions laid down in paragraphs 3 and 4 of that Article;

(4) Whereas Article 8 of Directive 96/62/EC requires that action plans be developed for zones within which concentrations of pollutants in ambient air exceed limit values, plus any temporary margins of tolerance applicable in order to ensure compliance with limit values by the date or dates laid down;

(5) Whereas Directive 96/62/EC provides that the numerical values for limit values are to be based on the findings of work carried out by international scientific groups active in the field; whereas the Commission is to take account of the most recent scientific research data in the epidemiological and environmental fields concerned, and of the most recent advances in metrology for re-examining the elements on which limit values are based;

(6) Whereas in order to facilitate the review of this Directive, the Commission and the Member States should consider encouraging research into the effects of the pollutants referred to herein, namely benzene and carbon monoxide;

(7) Whereas standardized accurate measurement techniques and common cirteria for the location of measuring stations are an important element in the assessment of ambient air quality with a view to obtaining comparable information across the Community;

(8) Whereas up-to-date information on concentrations of benzene and carbon monoxide in ambient air should be readily available to the public,

[1] OJ C 138, 17.5.1993, p. 5.

[2] OJ L 296, 21.11.1996, p. 55.

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HAS ADOPTED THIS DIRECTIVE:

Article 1

Objectives

The objectives of this Directive shall be to:

(a) establish limit values for concentrations of benzene and carbon monoxide in ambient air intended to avoid, prevent or reduce harmful effects on human health and the environment as a whole;

(b) assess concentrations of benzene and carbon monoxide in ambient air on the basis of common methods and criteria;

(c) obtain adequate information on concentrations of benzene and carbon monoxide in ambient air and ensure that it is made available to the public;

(d) maintain ambient air quality where it is good and improve it in other cases with respect to benzene and carbon monoxide.

Article 2

Definitions

The definitions in Article 2 of Directive 96/62/EC shall apply.

For the purposes of this Directive:

1. 'upper assessment threshold' shall mean a level specified in Annex III, below which a combination of measurements and modelling techniques may be used to assess ambient air quality, in accordance with Article 6(3) of Directive 96/62/EC;

2. 'lower assessment threshold' shall mean a level specified in Annex III, below which modelling or objective estimation techniques alone may be used to assess ambient air quality in accordance with Article 6(4) of Directive 96/62/EC;

3. 'fixed measurements' shall mean measurements taken in accordance with Article 6(5) of Directive 96/62/EC.

Article 3

Benzene

1. Member States shall take the measures necessary to ensure that concentrations of benzene in ambient air, as assessed in accordance with Article 5, do not exceed the limit value laid down in Annex I.

The margin of tolerance laid down in Annex I shall apply in accordance with Article 8 of Directive 96/62/EC.

2. Within zones and agglomerations, within which Member States can demonstrate that the application of measures to meet the limit value laid down in Annex I would result in severe socio-economic problems, the Commission may, acting in accordance with the procedure laid down in Article 12(2) of Directive 96/62/EC, grant time-limited extensions for meeting the limit value for periods of up to five years.

Article 4

Carbon monoxide

Member States shall take the measures necessary to ensure that concentrations of carbon monoxide in ambient air, as assessed in accordance with Article 5, do not exceed the limit value laid down in Annex II.

The margin of tolerance laid down in Annex II shall apply in accordance with Article 8 of Directive 96/62/EC.

Article 5

Assessment of concentrations

1. The upper and lower assessment thresholds for benzene and carbon monoxide for the purposes of Article 6 of Directive 96/62/EC shall be those laid down in Section I of Annex III.

The classification of each zone or agglomeration for the purposes of the same Article 6 shall be reviewed at least every five years in accordance with the procedure laid down in Section II of Annex III. Classification should be reviewed earlier in the event of significant change in activities relevant to ambient concentrations of benzene and carbon monoxide.

2. The criteria for determining the location of sampling points for the measurement of benzene and carbon monoxide in ambient air shall be those listed in Annex IV. The minimum number of sampling points for fixed measurements of concentrations of each relevant pollutant shall be as laid down in Annex V, and they shall be installed in each zone or agglomeration within which measurement is required if fixed measurement is the sole source of data on concentrations within it.

3. For zones and agglomerations within which information from fixed measurement stations is supplemented by information from other sources, such as emission inventories, indicative measurement methods and air quality modelling, the number of fixed measuring stations to be installed and the spatial resolution of other techniques shall be sufficient for the concentrations of air pollutants to be established in accordance with Section I of Annex IV, and Section I of Annex VI.

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4. For zones and agglomerations within which measurement is not required, modelling or objective-estimation techniques may be used.

5. The reference methods for the analysis and the sampling of benzene and carbon monoxide shall be as laid down in Sections I and II of Annex VII. Section III of Annex VII sets out reference techniques for air quality modelling.

6. The date by which Member States shall inform the Commission of the methods used for the preliminary assessment of air quality under point (d) of Article 11(1) of Directive 96/62/EC shall be the date set out in Article 9.

7. Any amendments necessary to adapt the provisions of this Article and Annexes III to VII to scientific and technical progress shall be adopted in accordance with the procedure laid down in Article 12 of Directive 96/62/EC.

Article 6

Public information

1. Member States shall ensure that up-to-date information on ambient concentrations of benzene and carbon monoxide is routinely made available to the public as well as to appropriate organisations, such as environmental organisations, consumer organisations, organisations representing the interests of sensitive populations and other relevant health-care bodies by means, for example, of broadcast media, press, information screens or computer-network services.

Information on ambient concentrations of benzene shall be updated on at least a monthly basis. Information on ambient concentrations of carbon monoxide shall be updated on at least a daily basis.

Such information shall at least indicate any exceedances of the concentrations stated in the limit values over the averaging periods laid down in Annexes I and II. It shall also provide a short assessment in relation to limit values and appropriate information regarding effects on health.

2. When making plans or programmes available to the public under Article 8(3) of Directive 96/62/EC, Member States shall also make them available to the organisations referred to in paragraph 1 of this Article.

3. Information made available to the public and to organisations under paragraphs 1 and 2 shall be clear, comprehensible and accessible.

Article 7

Report

1. No later than 31 December 2004 the Commission shall submit to the European Parliament and the Council a report based on the experience acquired in the application of this Directive and, in particular, on the results of the most recent scientific research concerning the effects on human health and ecosystems of exposure to benzene and carbon monoxide, and on technological developments including the progress achieved in methods of measuring and otherwise assessing concentrations of benzene and carbon monoxide in ambient air.

2. The report shall be presented as an integral part of an air quality strategy, designed to review and propose Community air quality objectives and develop implementing strategies to ensure the achievement of those objectives. The strategy shall take into account:

(a) the implementation of existing requirements relating to air quality, acidification and eutrophication, including progress in implementing limit values and target values established in accordance with Article 4 of Directive 96/62/EC;

(b) transport of pollution across national boundaries;

(c) the need for new or revised objectives relating to air quality, acidification and eutrophication;

(d) current air quality and trends up to and beyond the year 2010;

(e) the broad scope for making further reductions to polluting emissions across all relevant sources, taking account of their technical feasibility and cost-effectiveness;

(f) the relationships between pollutants and opportunities for combined strategies for achieving Community air quality and related objectives;

(g) current and future requirements for informing the public and for the exchange information between Member States and Commission;

(h) the experience acquired in the application of this Directive in Member States including, in particular, the conditions as laid down in Annex IV under which measurement has been carried out.

3. With a view to maintaining a high level of protection of human health and the environment, the report shall be accompanied by proposals for the amendment of this Directive if appropriate. In particular

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the Commission shall propose an absolute limit to the length of any further extensions to the timetable for meeting the limit value for benzene in Annex I which may be agreed under Article 3(2).

Article 8

Penalties

Member States shall determine the penalties applicable to breaches of the national provisions adopted pursuant to this Directive. The penalties shall be effective, proportionate and dissuasive.

Article 9

Implementation

1. Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive by 31 December 2001 at the latest. They shall forthwith inform the Commission thereof.

When Member States adopt those provisions, they shall contain a reference to this Directive or shall be accompanied by such a reference on the occasion of their official publication. Member States shall determine how such reference is to be made.

2. The Member States shall communicate to the Commission the text of the main provisions of national law which they adopt in the field covered by this Directive.

Article 10

Entry into force

This Directive shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Communities.*

Article 11

Addressees

This Directive is addressed to the Member States.

ANNEX I

LIMIT VALUE FOR BENZENE

The limit value must be expressed in $\mu g/m^3$. The volume must be standardised at a temperature of 293 K and a pressure of 101,3 kPa.

	Averaging period	Limit value	Margin of tolerance	Date by which limit value is to be met
Limit value for the protection of human health	Calendar year	5 $\mu g/m^3$	5 $\mu g/m^3$ (100 %) on the entry into force of this Directive, reducing on 1 January 2003 and every 12 months thereafter by equal annual percentages to reach 0 % by 1 January 2010	1 January 2010 (¹)

(¹) Except within zones and agglomerations within which a time-limited extension has been agreed in accordance with Article 3(2).

ANNEX II

LIMIT VALUE FOR CARBON MONOXIDE

The limit value must be expressed in mg/m^3. The volume must be standardised at a temperature of 293 K and a pressure of 101,3 kPa.

	Averaging period	Limit value	Margin of tolerance	Date by which limit value is to be met
Limit value for the protection of human health	eight hours (on a rolling basis)	10 mg/m^3	5 mg/m^3 (50 %) on the entry into force of this Directive, reducing on 1 January 2003 and every 12 months thereafter by equal annual percentages to reach 0 % by 1 January 2005	1 January 2005

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ANNEX III

DETERMINATION OF REQUIREMENTS FOR ASSESSMENT OF CONCENTRATIONS OF BENZENE AND CARBON MONOXIDE IN AMBIENT AIR WITHIN A ZONE OR AGGLOMERATION

I. Upper and lower assessment thresholds

The following upper and lower assessment thresholds will apply:

(a) *Benzene*

	Annual average
Upper assessment threshold	70 % of limit value (3,5 $\mu g/m^3$)
Lower assessment threshold	40 % of limit value (2 $\mu g/m^3$)

(b) *Carbon Monoxide*

	Eight-hour average
Upper assessment threshold	70 % of limit value (7 mg/m^3)
Lower assessment threshold	50 % of limit value (5 mg/m^3)

II. Determination of exceedances of upper and lower assessment thresholds

Exceedances of upper and lower assessment thresholds must be determined on the basis of concentrations during the previous five years where sufficient data are available. An assessment threshold will be deemed to have been exceeded if during those five years the total number of exceedances of the numerical concentration of the threshold is more than three times the number of exceedances allowed each year.

Where fewer than five years' data are available Member States may combine measurement campaigns of short duration during the period of the year and at locations likely to be typical of the highest pollution levels with results obtained from information from emission inventories and modelling to determine exceedances of the upper and lower assessment thresholds.

ANNEX IV

LOCATION OF SAMPLING POINTS FOR THE MEASUREMENT OF CONCENTRATIONS OF BENZENE AND CARBON MONOXIDE IN AMBIENT AIR

The following considerations will apply to fixed measurement.

I. Macroscale siting

Sampling points directed at the protection of human health should be sited:

(i) to provide data on the areas within zones and agglomerations where the highest concentrations occur to which the population is likely to be directly or indirectly exposed for a period which is significant in relation to the averaging period of the limit value(s);

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(ii) to provide data on levels in other areas within the zones and agglomerations which are representative of the exposure of the general population.

Sampling points should in general be sited to avoid measuring very small micro-environments in their immediate vicinity. As a guideline, a sampling point should be sited to be representative of air quality in a surrounding area of no less than 200 m^2 at traffic-orientated sites and of several square kilometres at urban-background sites.

Sampling points should also, where possible, be representative of similar locations not in their immediate vicinity.

Account should be taken of the need to locate sampling points on islands, where that is necessary for the protection of human health.

II. Microscale siting

The following guidelines should be met as far as practicable:

— The flow around the inlet sampling probe should be unrestricted without any obstructions affecting the airflow in the vicinity of the sampler (normally some metres away from buildings, balconies, trees, and other obstacles and at least 0,5 m from the nearest building in the case of sampling points representing air quality at the building line);

— in general, the inlet sampling piont should be between 1,5 m (the breathing zone) and 4 m above the ground. Higher positions (up to 8 m) may be necessary in some circumstances. Higher siting may also be appropriate if the station is representative of a large area;

— the inlet probe should not be positioned in the immediate vicinity of sources in order to avoid direct intake of emissions unmixed with ambient air;

— the sampler's exhaust outlet should be positioned so that recirculation of exhaust air to the sample inlet is avoided;

— location of traffic-orientated samplers:

  — for all pollutants, such sampling points should be at least 25 metres from the edge of major junctions and at least 4 m from the centre of the nearest traffic lane;

  — for carbon monoxide, inlets should be no more than 5 m from the kerbside;

  — for benzene, inlets should be sited so as to be representative of air quality near to the building line.

The following factors may also be taken into account:

— interfering sources;

— security;

— access;

— availability of electrical power and telephone communications;

— visibility of the site in relation to its surroundings;

— safety of public and operators;

— the desirability of co-locating sampling points for different pollutants;

— planning requirements.

III. Documentation and review of site selection

The site selection procedures should be fully documented at the classification stage by such means as compass-point photographs of the surrounding area and a detailed map. Sites should be reviewed at regular intervals with repeated documentation to ensure that selection criteria remain valid over time.

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ANNEX V

CRITERIA FOR DETERMINING NUMBERS OF SAMPLING POINTS FOR FIXED MEASUREMENT OF CONCENTRATIONS OF BENZENE AND CARBON MONOXIDE IN AMBIENT AIR

Minimum number of sampling points for fixed measurement to assess compliance with limit values for the protection of human health in zones and agglomerations where fixed measurement is the sole source of information

(a) *Diffuse sources*

Population of agglomeration or zone (thousands)	If concentrations exceed the upper assessment threshold	If maximum concentrations are between the upper and lower assessment thresholds
0-250	1	1
250-499	2	1
500-749	2	1
750-999	3	1
1 000-1 499	4	2
1 500-1 999	5	2
2 000-2 749	6	3
2 750-3 749	7	3
3 750-4 749	8	4
4 750-5 999	9	4
> 6 000	10	5

(b) *Point sources*

For the assessment of pollution in the vicinity of point sources, the number of sampling points for continuous measurement should be calculated taking into account emission densities, the likely distribution patterns of ambient air pollution and potential exposure of the population.

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ANNEX VI

DATA QUALITY OBJECTIVES AND COMPILATION OF RESULTS OF AIR QUALITY ASSESSMENT

I. Data quality objectives

The following data quality objectives, for required accuracy of assessment methods, and of minimum time coverage and of data capture of measurement are provided to guide quality-assurance programmes.

	Benzene	Carbon Monoxide
Continuous measurement		
Accuracy	25 %	15 %
Minimum data capture	90 %	90 %
Indicative measurement		
Accuracy	30 %	25 %
Minimum data capture	90 %	90 %
Minimum time coverage	14 % (one measurement a week at random, evenly distributed over the year, or 8 weeks evenly distributed over the year)	14 % (one measurement a week at random, evenly distributed over the year, or 8 weeks evenly distributed over the year)
Modelling		
Accuracy:		
eight-hour averages	—	50 %
annual averages	50 %	—
Objective estimation		
Accuracy:	100 %	75 %

The accuracy of the measurement is defined as laid down in the 'Guide to the Expression of Uncertainty of Measurements' (ISO 1993), or in ISO 5725-1 'Accuracy (trueness and precision) of measurement methods and results' (1994). The percentages in the table are given for individual measurements averaged, over the period considered, by the limit value, for a 95 % confidence interval (bias + two times the standard deviation). The accuracy for continuous measurements should be interpreted as being applicable in the region of the appropriate limit value.

The accuracy for modelling and objective estimation is defined as the maximum deviation of the measured and calculated concentration levels, over the period considered, by the limit value, without taking into account the timing of the events.

The requirements for minimum data capture and time coverage do not include losses of data due to the regular calibration or the normal maintenance of the instrumentation.

II. Results of air quality assessment

The following information should be compiled for zones or agglomerations within which sources other than measurement are employed to supplement information from measurement or as the sole means of air quality assessment:

— a description of assessment activities carried out;

— the specific methods used, with references to descriptions of the method;

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— the sources of data and information;

— a description of results, including accuracies and, in particular, the extent of any area or, if relevant, the length of road within the zone or agglomeration over which concentrations exceed limit value(s) or, as may be, limit value(s) plus applicable margin(s) of tolerance and of any area within which concentrations exceed the upper assessment threshold or the lower assessment threshold;

— for limit values the object of which is the protection of human health, the population potentially exposed to concentrations in excess of the limit value.

Where possible, Member States should compile maps showing concentration distributions within each zone and agglomeration.

III. **Standardisation**

For benzene and carbon monoxide the volume must be standardised at a temperature of 293 K and a pressure of 101,3 kPa.

ANNEX VII

REFERENCE METHODS FOR ASSESSMENT OF CONCENTRATIONS OF BENZENE AND CARBON MONOXIDE

I. **Reference method for the sampling/analysis of benzene**

The reference method for the measurement of benzene will be the pumped sampling method on a sorbent cartridge followed by gas chromatographic determination that is currently being standardized by CEN. In the absence of a CEN standardized method, the Member States are allowed to use national standard methods based on the same measurement method.

A Member State may also use any other method which it can demonstrate gives results equivalent to the above method.

II. **Reference method for the analysis of carbon monoxide**

The reference method for the measurement of carbon monoxide will be the non-dispersive infrared spectometric (NDIR) method, that is currently being standardized by CEN. In the absence of a CEN standardized method, the Member States are allowed to use national standard methods based on the same measurement method.

A Member State may also use any other method which it can demonstrate gives results equivalent to the above method.

III. **Reference modelling techniques**

Reference modelling techniques cannot be specified at present.

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